CHECKLIST ENVIRONMENTAL ASSESSMENT

FOR THE

MILLCREEK TIMBER SALE

Prepared by David Marsh
Northeastern Land Office - DNRC
June, 2000

TABLE OF CONTENTS

CHECKLIST ENVIRONMENTAL ASSESSMENT

Project Name: Mill Creek Timber Sale Proposed Implementation Date: Fall 2000
Proponent: Montana Department of Natural Resources and Conservation - Northeastern Land Office
Type and Purpose of Action: The Montana DNRC plans to harvest up to 800 thousand board feet (MBF) of timber from up to 120 acres (see attachment A1 - Vicinity map) and contribute up to approximately $130,400.00 (based on current stumpage rates) to the school trust fund. Up to 0.75 miles of new road will be constructed. This proposal is expected to increase and maintain stand productivity and over-all stand health.
Location: SE4 Sec. 16, T14N, R18E County: Fergus

I. PROJECT DEVELOPMENT	
1. PUBLIC INVOLVEMENT, AGENCIES, GROUPS OR INDIVIDUALS CONTACTED: Provide a brief chronology of the scoping and ongoing involvement for this project.	On February 23, 2000 – March 23, 2000, a public notice was listed in the Lewistown News-Argus, a newspaper of general circulation and published in Lewistown, Montana. Letters describing the proposed project and requesting public input were mailed on Feb. 22, 2000. Montana State Agencies: Agriculture and Grazing Management Bureau; Fish Wildlife and Parks. Neighboring Landowners: Alden & Gladys Torgrimson, Ted and Georgia Arndt, Francis and Jacalyn Rickl, Constance Gauer, Albert & Linda Piccioni, George & Eva Birdwell, Genevieve Gans and Larry Carlson. Others: Montana Wood Products Association, Tribal Historic Preservation Office – Confederated Salish and Kootenai Tribes, Stuart Lewin, Ecology Center, Alliance for the Wild Rockies, Plum Creek Timber Co., F.H. Stoltze Land and Lumber, Central Montana Conservation Association. Friends of the Wild Swan, Fergus County Commissioners, Fergus Co. Conservation District, Fergus Co. Weed Department,and Montana Heritage Program. Issue statements have been developed based on all public scoping responses and can be found in the project file. Comments and concerns have been addressed and incorporated in the EA.
2. OTHER GOVERNMENTAL AGENCIES WITH JURISDICTION, LIST OF PERMITS NEEDED:	Montana Dept. of Fish, Wildlife and Parks for Stream Protection Act permit, Montana State Airshed Coordination Group for Hazard Reduction and Constance Gauer for Right-of-Way Agreement (reference project file).
3. ALTERNATIVES CONSIDERED:	No Action Alternative: This Alternative would postpone any timber harvest activity at this time, but would continue current grazing lease agreement. Potential effects of the "No Action Alternative" include reduced tree growth rates, declining forage and grazing potential and increased risk of stand replacement wildfire. Additionally, revenue opportunity may be lost as dead and dying timber is lost to decay, insects, windthrow and wildfire. Action Alternative: The proposed action would commercially harvest up to 800 MBF on up to 120 acres and would require up to 0.75 miles of new road construction. The sale of forest products would produce revenue for the public school trust fund, while ensuring the long-term productivity and revenue generating capacity. The sale would utilize commercial thinning to reduce competition and improve stand and forage productivity while mitigating potential adverse impacts and maintaining desirable stand structural and habitat elements. The State Forest Land Management Plan (SFLMP) Resource Management Standards (RMS) were considered in developing these alternatives.

II. IMPACTS ON THE PHYSICAL ENVIRONMENT

RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES N = Not present or No Impact will occur. Y = Impacts may occur (explain below)
4. GEOLOGY AND SOIL QUALITY, STABILITY AND MOISTURE: Are fragile, compactible or unstable soils present? Are there unusual geologic features? Are there special reclamation considerations? Are cumulative impacts likely to occur as a result of this proposed action?	[Y] Some compactible and unstable soils are present and some degree of cumulative impacts may occur. No unusual geological features are present. There are no special reclamation considerations. All specialists' recommendations and mitigations as well as Best Management Practices (BMPs) will be implemented to protect soil resources. See attachment B for watershed and soil existing conditions and direct, indirect and cumulative environmental effects.
5. WATER QUALITY, QUANTITY AND DISTRIBUTION: Are important surface or groundwater resources present? Is there potential for violation of ambient water quality standards, drinking water maximum contaminant levels, or degradation of water quality? Are cumulative impacts likely to occur as a result of this proposed action?	[Y] The project area is drained by both Casino and Mill Creeks. Four unnamed tributaries (two ephemeral and two largely intermittent) have origins in the project area. Mitigations include SMZ law requirements, SFLMP Resource Management Standards and BMPs as well as implementation of all specialist recommendations. See attachment B for watershed and soil existing conditions and direct, indirect and cumulative effects.
6. AIR QUALITY: Will pollutants or particulate be produced? Is the project influenced by air quality regulations or zones (Class I airshed)? Are cumulative impacts likely to occur as a result of this proposed action?	[Y] The project area is located within Airshed 9. State Hazard Reduction Standards will be mitigated by initiating slash disposal (by DNRC personnel) during seasonal burning periods and completed by following procedures established by the State Airshed Coordination Group.
7. VEGETATION COVER, QUANTITY AND QUALITY: Will vegetative communities be permanently altered? Are any rare plants or cover types present? Are cumulative impacts likely to occur as a result of this proposed action?	[Y] No lasting vegetative changes are anticipated. No rare plants or cover types have been identified in the project area (Reference Project File, Montana Natural Heritage Program letter). The stand to be treated under the action alternative does not meet DNRC's definition as old growth. See attachment A, Vegetation for stand description. Primary effects will be decreased canopy cover and reduced stems per acre. Secondary impacts may include windthrow and wind snap susceptibility (refer to attachment A, Vegetation for additional information including environmental and cumulative effects). Prescribed treatments are intended to increase forest health, tree growth and forage productivity while addressing the risk of potential adverse impacts. Refer to Attachment A2 for silvicultural prescriptions.
8. TERRESTRIAL, AVIAN AND AQUATIC LIFE AND HABITATS: Is there substantial use of the area by important wildlife, birds or fish? Are cumulative impacts likely to occur as a result of this proposed action?	[N] The proposal area is frequented by terrestrial game and nongame wildlife and birds common to the area. Displacement of certain species during harvest operations and some reduction of hiding cover will be direct impacts of this proposal. Secondary impacts include increased forage availability for some species through increased grass and forb production and increased over-all habitat diversity through stand structure alterations. Mitigations include Compliance with SFLMP Resource Management Standards, BMPs and adherence to silvicultural prescription. See attachment A1. No fish bearing streams exist within the project area however an upgrade of an existing culvert crossing of Mill Creek on private property will be necessary. Stream Protection Act permit stipulations will be adhered to during this proposed improvement operation. See attachment B for further information on cold water fisheries. Some degree of cumulative impacts may occur as a result of this proposal given that some adjacent property timber has been harvested.
9. UNIQUE, ENDANGERED, FRAGILE OR LIMITED ENVIRONMENTAL RESOURCES: Are any federally listed threatened or endangered species or identified habitat present? Any wetlands? Sensitive Species or Species of special concern? Are cumulative impacts likely to occur as a result of this proposed action?	[N] No federally listed threatened or endangered species or identified habitat are known to exist within the project area. No wetlands exist within the project area; however, wet spots do occur within two largely intermittent stream channels. These wet spots will be protected by Streamside Management Zones where applicable. No sensitive species or species of special concern have been observed within the project area. It may be possible for Ferruginous hawks (sensitive species) to move through the project area or nest in somewhat nearby grasslands. See attachment A, Table 1 (reference Project File, Natural Heritage Program letter).
10. HISTORICAL AND ARCHAEOLOGICAL SITES: Are any historical, archaeological or paleontological resources present?	[N] No recorded historical, archeological or paleontological resources present (Reference Project File, Patrick Rennie Memo).

11. AESTHETICS: Is the project on a prominent topographic feature? Will it be visible from populated or scenic areas? Will there be excessive noise or light? Are cumulative impacts likely to occur as a result of this proposed action?	[N] Project area is located on and within common topographical features typical of the area. No excessive noise, light or cumulative impacts are anticipated to occur as a result of this proposal.
12. DEMANDS ON ENVIRONMENTAL RESOURCES OF LAND, WATER, AIR OR ENERGY: Will the project use resources that are limited in the area? Are there other activities nearby that will affect the project? Are cumulative impacts likely to occur as a result of this proposed action?	[N] The project area will not use resources that are limited in the area. Other activities nearby are not expected to affect the project. No cumulative impacts are likely to occur as a result of the proposed action.
13. OTHER ENVIRONMENTAL DOCUMENTS PERTINENT TO THE AREA: Are there other studies, plans or projects on this tract? Are cumulative impacts likely to occur as a result of other private, state or federal current actions w/n the analysis area, or from future proposed state actions that are under MEPA review (scoping) or permitting review by any state agency w/n the analysis area?	[Y] The project area is classified grazing land (Lease No. 1124). There is a surface domestic water right immediately downstream of the proposed project area on Casino Creek. No adverse effects are anticipated to occur in conjunction with activities proposed under the action alternative (reference Project file, Beneficial Use memo from George Mathieus). No other studies or projects are planned for this tract, although increased forage production is anticipated with successful completion of the action proposal. No cumulative impacts are likely to occur from future state actions currently under MEPA review by any state agency within the analysis area.

III. IMPACTS ON THE HUMAN POPULATION	
RESOURCE	[Y/N] POTENTIAL IMPACTS AND MITIGATION MEASURES
14. HUMAN HEALTH AND SAFETY: Will this project add to health and safety risks in the area?	[N] Potential human safety risks may vary with those individuals actively involved with "on-site" harvest operations. Different types of tools, machinery and style of operations have the most influence on human safety risks. Safety rules and regulations apply through the Occupational Health and Safety Act (OHSA) and are administered by workers of that program.
15. INDUSTRIAL, COMMERCIAL AND AGRICULTURAL ACTIVITIES AND PRODUCTION: Will the project add to or alter these activities?	[Y] This proposal is expected to increase forestland and rangeland productivity.
16. QUANTITY AND DISTRIBUTION OF EMPLOYMENT: Will the project create, move or eliminate jobs? If so estimated number. Are cumulative impacts likely to occur as a result of this proposed action?	[N] People are currently employed in the wood products industry in the region. Due to the relatively small size of the timber sale program, there will be no measurable cumulative impact from this proposed action on employment.
17. LOCAL AND STATE TAX BASE AND TAX REVENUES: Will the project create or eliminate tax revenue? Are cumulative impacts likely to occur as a result of this proposed action?	[N] People are currently paying taxes from the wood products industry in the region. Due to the relatively small size of the timber sale program, there will be no measurable cumulative impact from this proposed action on tax revenues.
18. DEMAND FOR GOVERNMENT SERVICES: Will substantial traffic be added to existing roads? Will other services (fire protection, police, schools, etc) be needed? Are cumulative impacts likely to occur as a result of this proposed action?	[N] There will be no measurable cumulative impacts related to demand for government services due to the relatively small size of the timber sale program, the short-term impacts to traffic, the small possibility of a few people temporarily relocating to the area, and the lack of other timber sales in the adjacent area.
19. LOCALLY ADOPTED ENVIRONMENTAL PLANS AND GOALS: Are there State, County, City, USFS, BLM, Tribal, etc. zoning or management plans in effect?	[Y] In June 1996, DNRC began a phased-in implementation of the State Forest Land Management Plan (Plan). The management direction provided in the Plan comprises the framework within which specific project planning and activities take place. The Plan philosophy and appropriate Resource Management Standards have been incorporated into the design of the proposed action.

20.	ACCESS TO AND QUALITY OF RECREATIONAL AND WILDERNESS ACTIVITIES: Are wilderness or recreational areas nearby or accessed through this tract? Is there recreational potential within the tract? Are cumulative impacts likely to occur as a result of this proposed action?	[Y] No wilderness or recreational areas are nearby or accessed through this tract. Some recreation potential does exist, but is limited to select individuals successful in obtaining access from adjoining landowners for the purposes of hunting, hiking or wildlife viewing. There is no legal, public access to this tract. No cumulative impacts are likely to occur as a result of this proposed action.
21.	DENSITY AND DISTRIBUTION OF POPULATION AND HOUSING: Will the project add to the population and require additional housing? Are cumulative impacts likely to occur as a result of this proposed action?	[N] There will be no measurable impacts related to population and housing due to the relatively small size of the timber sale program, and the fact that people are already employed in this occupation in the region.
22.	SOCIAL STRUCTURES AND MORES: Is some disruption of native or traditional lifestyles or communities possible?	[N]
23.	CULTURAL UNIQUENESS AND DIVERSITY: Will the action cause a shift in some unique quality of the area?	[N]
24.	OTHER APPROPRIATE SOCIAL AND ECONOMIC CIRCUMSTANCES: Is there a potential for other future uses for easement area other than for timber management? Is future use hypothetical? What is the estimated return to the trust. Are cumulative impacts likely to occur as a result of this proposed action?	[N] Costs, revenues and estimates of return are estimates intended for relative comparison of alternatives. They are not intended to be used as absolute estimates of return. The estimated stumpage is based on comparable sales analysis. This method compares recent sales to find a market value for stumpage. These sales have very similar species, quality, average diameter, product mix, terrain, date of sale, distance from mills, road building and logging systems, term of the sale or anything that could affect a buyer's willingness to pay for stumpage. Under the action alternative, between an estimated 500 to 800 MBF (thousand board feet) of timber will be harvested yielding between $81,500 and $130,400 respectively to the school trust fund.

EA Checklist Prepared By:

David Marsh	Timber Sale Specialist, NELO	June 13, 2000
Name	Title	Date

IV. FINDING

25. ALTERNATIVE SELECTED:	Action Alternative – Will meet project objectives and resource management objectives of the State Forest Land Management Plan.
26. SIGNIFICANCE OF POTENTIAL IMPACTS:	Potential impacts have been adequately addressed in the EA.

27. Need for Further Environmental Analysis:

[ ] EIS [ ] More Detailed EA [X] No Further Analysis

EA Checklist Approved By: Barny Smith (Name) Lewistown Unit Manager - NELO (Title)

(Signature) 8/18/00 (Date)

Physical Description, History, Vegetation and Wildlife: Affected environment and environmental effects

Physical Description

The proposed Mill Creek Timber Sale is located within the SE4 of Sec. 16, Twp. 14N, Rge. 18E of Fergus Co. in the foothills of the Big Snowy Mountains. This 160-acre state quarter section straddles the top of a relatively flat, broad ridge running generally from the SE to the N. Four draws originate near the top on both the E and W aspects of this ridge. Two of these draws are on the W aspect and are ephemeral draining to Casino Cr. (approximately 1/5 mile to the west). The other two draws on the E aspect, are largely intermittent draining to the E and converge near the E section line of Sec. 16. This main draw contains portions of perennial, intermittent and ephemeral flows eventually draining in to Mill Cr. (approximately 1/5 mile to the E). A two-track road runs generally N – S and basically through the middle of this tract paralleling a fence line. For a visual description, see Vicinity Map (attachment A1) and for further information on hydrology, see attachment B.

Stand History

There is little information available on the history of this area beyond the current DNRC grazing lease and timber sale records. Some pre-recorded selective logging has taken place as evidenced by old stumps. Surrounding areas (reference Little Snowies Vegetative management and Public Access Final EIS, USFS August 1993) suggest pre-settlement condition as 58 % open grassland, 35 % grassland/savannah pine (20-50 TPA) with 25-40 % canopy closure), 2.5 % in a closed canopy state and about 3 % in aspen stands.

Based on interpretation of fire maps of similar areas (Little Snowies), forest structures indicate major forest fires around 1885 with a historical fire frequency of approximately 30 years prior to settlement (reference Little Snowies FEIS, USFS 1993).

Three small post and pole thinning operations were conducted during the early 80s in selected areas on this tract. Reference, TP #s 11751, 11754 and 11758. A timber trespass occurred within this tract during 1985 along the S section line during a timber cutting operation on adjacent property. This trespass resulted in an unauthorized removal of 2,220 board feet of the state's Ponderosa pine timber. A double stumpage penalty was enacted as a fine (reference, Timber Permit #11920).

Environmental and Cumulative Affects

Under the proposed action alternative, treatments would emulate natural, low intensity wildfire moving the overall stand condition closer to that which would be expected under pre-settlement conditions (See Silvicultural prescription (Attachment A2) for details concerning the proposed treatment see attachment A2). Equipment limitations as well as

protecting the integrity of draw features conflicts with harvesting certain areas contrary to what wildfire might otherwise have done.

No historical or archeological cumulative affects are likely to occcur as a result of this proposal. See Project file, Patrick Rennie (DNRC Archeologist) memo for further information.

Vegetation

This tract is 100 % forested. The overstory consists of Ponderosa pine with a minor component of Douglas-fir. The stand is largely made up of a single cohort with little structural variability. Conditions associated with this stand's structure are very continuous heavy fuels and stressed growing conditions for trees. The forest successional stage best describing the current condition of this stand is "the stem exclusion phase". This phase generally describes stands that have developed overstocked conditions resulting in selected tree mortality. These conditions are often very hazardous for both stand replacement wildfire risk as well as significant vulnerability to insect and disease damage.

Past post/pole thinnings mentioned above in selected areas removed some trees mostly in the 5-8 inch DBH class and left dominant/codominant trees at an average spacing of approximately 14 ft. In these areas, there has been a slight reduction in risk of loss due to both stand replacement wildfire and insects or disease damage; however, a very high risk remains. The trees left after the thinning did respond to decreased competition, increasing growth rates for a short period of time but now have largely returned to a state of low vigor.

In general, this tract contains little understory vegetation. The primary understory vegetation element consists largely of grass species such as Pinegrass *Calamagrostis rubescens*). Some forbs such as Western Yarrow *Achillea millefolium* and Heartleaf Arnica *Arnica cordifolia* are fairly common as well. Shrub species such as Oregon Grape *Berberis repens* occur commonly throughout the tract. Other shrub species such as Snowberry *Symphoricarpos albus* and Serviceberry *Amelanchier alnifolia* occur in isolated patches. Some understory tree species such as Black Hawthorne *Crataegus douglasii* and Rocky Mountain Maple *Acer glabrum* occur in very isolated patches.

The stand to be treated within the project area does not meet DNRC's definition of Old Growth. A few occasional old, relic trees do exist within this stand. Under the action alternative, no greater than half of the trees displaying natural, old growth characteristics would be removed.

Environmental and Cumulative Affects

The proposed action alternative would remove up to 800 MBF of timber and would retain approximately 50 - 100 square feet of basal area per acre on average. See Silvicultural prescription (Attachment A2) for details concerning the proposed treatment. Primary

affects would be a reduction in overall overstory tree canopy coverage and basal area per acre generally creating a less continuous stand structure. Secondary affects would likely include an increase in understory vegetation and increased vigor of remaining overstory trees. Adverse secondary impacts may include increased susceptibility to windthrow particularly near the edges of the ridgetop. Mitigations include retention of trees displaying windfirmness as well as selecting entire groups of trees for retention where appropriate. Adherence to the State Forest Land Management Plan (SFLMP) Resource Management Standards will ensure protection of many resources. Standards including Biodiversity, Silviculture and Weed Management will be implemented. Private property containing timber and bordering the project area to the south and east has been selectively harvested. No cumulative impacts to vegetation are likely to occur as a result of this proposal.

Wildlife

The project area is used by non-game and game species common to the area. Some of the non-game wildlife includes various species of rodents including the Red squirrel *Tamiasciurus hudsonicus* and Least chipmunk *Tamias minimus,* various species of songbirds such as the American robin *Turdus migratorius* and Black-billed magpie *Pica pica,* and raptors such as the Great horned owl *Bubo virginianus* and Red-tailed hawk *Buteo jamaicensis*. The most abundant of the game species common to the area are White-tailed deer *Odicileus virginianus* and Wild turkey *Meleagris galloppavo*.

Separate notices were mailed to three Montana Fish, Wildlife and Parks biologists soliciting comment in regards to this proposed timber sale. These biologists are: Anne Tews, Fisheries Biologist, Kristi DuBois, Nongame Species Biologist and Tom Stivers, Game Species Biologist. No comments or concerns were received in relation to these specific letters.

The Natural Heritage Program database for the project area shows no records of species of special concern (Reference Project File, Natural Heritage Program letter). Trained DNRC field foresters have made no observations of threatened, endangered or sensitive species and the Northeastern Land Office (NELO) has received no reports of threatened, endangered or sensitive species occurring on this tract. (see Table 1. below). For information concerning cold water fisheries, see Hydrologist report (Attachment B).

Table 1.

CHECKLIST FOR ENDANGERED, THREATENED AND SENSITIVE SPEICES
Pertains to Section II. 9. of the DS-252 DNRC Environmental Checklist

NORTHEASTERN LAND OFFICE

Threatened and Endangered Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)

Bald Eagle (*Haliaeetus leucocephalus*) Habitat: late-successional forest <1 mile from open water	[N] DNRC is unaware of any bald eagle nests in the vicinity of the Mill Creek Timber Sale proposal area. Mill and Casino Creeks are likely too small to provide an ample forage base for nesting eagles and other large bodies of water capable of providing for the needs of bald eagles are not present within 1 mile of the project area. No impacts to bald eagles are expected to occur as a result of this project.
Gray Wolf (*Canis lupus*) Habitat: ample big game pops., security from human activity	[N] No wolves or den sites are known to be present in the vicinity of the project area. No impacts to wolves are expected to occur as a result of this project.

DNRC Sensitive Species	[Y/N] Potential Impacts and Mitigation Measures N = Not Present or No Impact is Likely to Occur Y = Impacts May Occur (Explain Below)
Harlequin Duck (*Histrionicus histrionicus*) Habitat: white-water streams, boulder and cobble substrates	[N] No harlequin observations have been reported within the vicinities of Mill or Casino Creeks. Both Mill and Casino Creeks are low gradient streams with limited amounts of rock or cobble substrate. Neither Mill nor Casino Creek provide suitable habitat for harlequin ducks. No impacts to harlequin ducks are expected to occur as a result of this project.
Ferruginous Hawk (*Buteo regalis*) Habitat: prairies and badlands	[N] No ferruginous hawk observations have been reported in or near the Mill Creek Timber Sale project area. No badland habitat or bluffs suitable for nesting ferruginous hawks are known to occur within the project area or within ½ mile from the project area boundary. However, ferruginous hawks may occasionally move through the area or potentially nest in grasslands over a mile away from the proposed project area. No impacts to ferruginous hawks are likely to occur as a result of this project, however, should any ground nesting hawks be observed within 400 meters of proposed haul routes or active harvest units, harvest activities would cease and a DNRC biologist would be contacted immediately.

	Site specific mitigations would then be assigned to protect the nest site if nesting ferruginous hawks are detected.
Mountain Plover (*Charadrius montanus*) Habitat: short-grass prairie, alkaline flats, prairie dog towns	[N] No mountain plover observations have been reported in or near the Mill Creek Timber Sale proposal area. No shortgrass prairie habitat suitable for mountain plovers occurs within the project area or vicinity. No impacts to mountain plover are expected to occur as a result of this project.
Townsend's Big-Eared Bat (*Plecotus townsendii*) Habitat: caves, caverns, old mines, large cliff features	[Y] No suitable habitat for Townsends Big-Eared Bats is known to occur within the proposed project area or nearby vicinity.
Peregrine Falcon (*Falco peregrinus*) Habitat: cliff features near open foraging areas and/or wetlands	[N] DNRC is unaware of peregrine falcon nests in the vicinity of the Mill Creek Timber Sale proposal area. No impacts to peregrines are expected to occur as a result of this project.
Ross Baty, DNRC Forest Management Bureau Biologist was consulted during preparation of this checklist	

Environmental and Cumulative Affects

The proposed action alternative would remove up to 800 MBF and would retain approximately 50-100 square feet of basal area per acre on average.

Due to the small area affected by this proposal, the cumulative affects analysis area consists of all adjacent private property adjoining the state SE 1/4 of section 16, Township 14N, Range 18E. owned by Alden and Gladys Torgrimson, Francis and Jacalyn Rickl, Constance Gauer, Richard E. and Leona Strouf and Ted and Georgia Arndt. Property owned by Constance Gauer and Richard E. and Leona Strouf adjoining the state ¼ section to the east and south have been selectively harvested producing a reduction in hiding and thermal cover for big game species.

Under the action alternative, the proposed treatment primarily consisting of group selection and commercial thinning would be expected to have short term negative impacts and long term positive impacts to certain species. The action alternative would be expected to increase overall wildlife habitat diversity over time while maintaining elements of the current stand structure and minimizing detrimental impacts to current habitat elements through selective harvest practices.

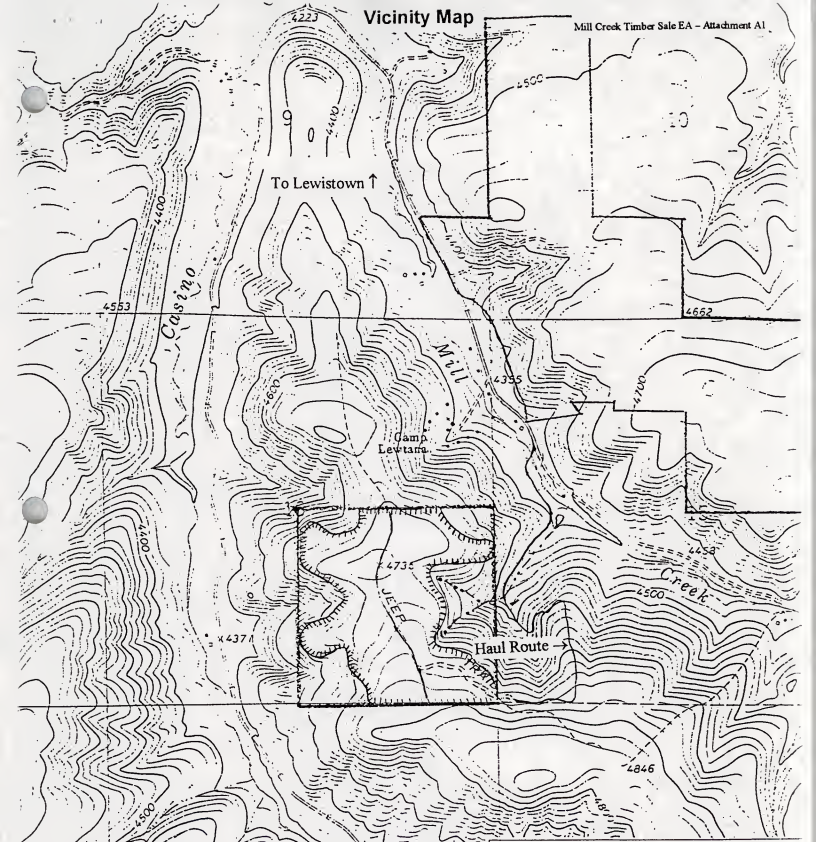
Currently, there is little available forage for big game species due to the continuous canopy of the overstory as evidenced by heavy browsing on existing forage vegetation.

Big game hiding and thermal cover would be temporarily decreased as a result of selective overstory removal but over time shrub, forb, grass and conifer regeneration growth would be expected to increase both hiding cover and forage. Thermal cover would be retained in roughly 40 acres of untreated stand as well as selected leave tree groups of up to approximately ¼ acre in size within the proposed treatment area.

Additional mitigations include adherence to the (SFLMP) Resource Management Standards ensuring additional protection for numerous resources. Standards including Biodiversity, Fisheries, Threatened and Endangered Species, Sensitive Species and Big Game will be implemented.

Vicinity Map

Mill Creek Timber Sale EA – Attachment A1



Legend

Existing Road	———
Proposed New Road Construction	= = = = =
Harvest Unit Boundary	⊔⊔⊔⊔⊔
County Road	═══

SILVICULTURAL PRESCRIPTION

TWP: 14N RG: 18E SEC: SE4 16 STAND: 1 AC: 100 Date: August 18, 2000

Aspect: Flat (some E & W)
Slope: 0-35% Prepared by: Dave Marsh
Avg. Elevation: 4,700 Ft.
Range: 4,780-4,600 Unit: Northeastern Land Office
Parent material/soils: sandstones and shales / sandy loam to sandy clay loam.
Habitat type(s): PSME / CARU
Productivity: Moderate to Moderately High
Management Objective: Increase timber and rangeland productivity. Reduce stand replacement wildfire and insects and disease infestation risk.

DESCRIPTION OF EXISTING STAND:
Average Current Stand Statistics: TPA = 257, Height = 65 Ft., DBH = 11, Age = 108, BA/Ac. = 184

This largely even-aged stand is dominated by densely stocked Ponderosa pine (PP) mostly in the stem exclusion phase of forest succession. Approximately 1% of the overstory stand is comprised of Douglas-fir (DF). Some regeneration (mostly DF) is occurring as ingrowth in isolated, small patches where the overstory crown closure is less continuous. Understory shrub vegetation is minimal.

This stand is currently at high risk of stand replacement wildfire, increased loss of growth potential due to over-competition, and significant insect mortality. The current risk factors are identified as follows: Continuous, heavy fuels exist with a growing presence of ladder fuels creating a high risk of stand replacement wildfire. Isolated signs of Mtn. Pine beetle damage currently exist in the area and the stand's continuity as well as its increasingly low vigor are high risk factors for significant insect mortality. Currently, there is evidence of tree mortality and decreased diameter growth (evidenced by increment cores) due to increasingly greater crown competition.

Several small past post / pole thinning units exist throughout the overall stand harvested approximately 15-20 years ago. Records show that over-all growth rates increased in the residual trees in these units for a short period of time but have now decreased once again.

CONSTRAINTS: Short term access agreement and significant potential for windthrow and relatively close proximity to Lewistown.

TARGET STAND — Structure: Clumpy, multi-structured, multi-aged stand with small areas of naturally stocked, mature PP as well as daylighted openings. Some areas would also contain evenly spaced, dominant or co-dominant PP with canopy coverage averaging approximately 50%. Certain other small areas may display open, parklike PP stand characteristics.

Species composition: Slightly increased occurrence of mature DF increasing over-all stand species diversity.

Conditions @ age: Post Harvest TPA: 100 - 130 Crown ratios: ≥40 % Min % stocked: 10 - 20 %

Harvest @ age: Uneven-aged management Potentially every 10-20 years Stocking (BA or SDI): Variable Avg. DBH: Variable

Other targets: Provide examples of various silvicultural prescriptions and future harvest opportunities.

ANALYSIS—Does stand currently meet target conditions: No
Can existing stand be managed to meet target conditions: Yes

DISCUSSION: Reduce Basal Area to between 50-100 square feet per acre on average. Create multi-cohort / mosaic structure. Cut across merchantable (≥9" DBH) diameter distribution range, possibly including an option to harvest some smaller round-wood (pulp-sized trees) and retain ≥ 50% of trees displaying natural, old growth characteristics. Use spacing in larger, isolated clumps to provide semblance of even aged-management.

PRESCRIBED TREATMENTS Combination of Group selection, Individual tree selection and Commercial thinning.

IMPLEMENTATION NOTES: Existing snags will be retained to the fullest extent possible. Snag recruitment of one or two trees per acre is desired. Existing openings conducive for landing and decking areas will be utilized where practical. Lop and scatter and or return skidding of slash may be utilized as a means of maintaining approximately 10 tons of large woody debris per acre for maintenance of soil nutrition.

TO: **Dave Marsh, Timber Sale Specialist, NELO**

cc: **Jeff Collins, Soil Scientist, Forest Management Bureau**
Gary Frank, Hydrologist, Forest Management Bureau
Craig Roberts, Manager, NELO
Bill Schultz, Supervisor, State Land Management Section

FROM: **George Mathieus, Hydrologist, Forest Management Bureau**

SUBJECT: **Mill/Casino Proposed Timber Sale Soils, Hydrology, and Fisheries Report**

DATE: **April 3, 2000**

Existing Conditions/Effects Analysis
Mill/Casino Proposed Timber Sale
Section 16 SE ¼, T14N-R18E
Northeastern Land Office

INTRODUCTION

The following document contains background information for the watershed and soils portion of the proposed Mill/Casino Timber Sale Environmental Assessment. This analysis includes an existing conditions and effects assessment of all watercourses draining the proposed sale area. Write-up and assessments are based on a coarse filter screening approach and an on-site field review of all contributing areas within the proposed sale area.

POTENTIAL ISSUES

Soil Resources:

Equipment operations and timber harvest on wet sites or sensitive soils can result in soil impacts that effect soil productivity depending on area and degree of physical effects and amount or distribution of course woody debris retained for nutrient cycling.

Water Quality:

Timber harvest, road construction and road use can impact water quality primarily by accelerating sediment delivery above natural levels to local stream channels and draw bottoms. These impacts are caused by erosion from road surfaces, skid trails, log landings and by the removal of vegetation along stream channels.

Cumulative Watershed Effects:

Cumulative watershed effects can be characterized as impacts on water quality and quantity that result from the interaction of disturbances, both human-caused and natural. Timber harvest can affect the timing of runoff, increase peak flows and increase the total annual water yield of a particular drainage.

Cold Water Fisheries:

Land management activities such as timber harvest and road construction can impact fish habitat primarily by increasing water temperatures, accelerating sediment delivery above natural levels to local stream channels and by decreasing large woody debris and shade cover through the removal of recruitable trees near the stream channel.

AFFECTED ENVIRONMENT

Hydrologic Setting:

The proposed sale area lies within a State ¼ section surrounded by private lands. Precipitation averages 20 inches annually. The proposed sale area is drained by Casino Creek, a 4949-acre (from the headwaters to the Mill Creek confluence) third order tributary to Big Spring Creek and Mill Creek, a 2002-acre second order tributary to Casino Creek. Both are Class I perennial streams under the Montana Streamside Management Zone (SMZ) Law and Rules.

All stream channels and ephemeral draw bottoms draining the proposed sale area were evaluated. The watershed analysis area has been further divided into 4 unnamed tributaries of Casino and Mill Creeks to facilitate hydrologic analysis and cumulative watershed effects assessment (see attached map). Each drainage feature draining the sale area is described below.

Tributary A:

This unnamed tributary to Mill Creek has reaches of perennial, intermittent and ephemeral flow. The headwaters are seepy and wet, then it flows through a steep, confined draw where it becomes a Class II stream. As the valley becomes less confined, the stream flows intermittent and then ephemeral as it reaches a broad swale and ultimately a marsh. There was no evidence of surface water connectivity to Mill Creek.

Tributary B:

This unnamed tributary to Mill Creek is immediately north of Tributary A. It also has a Class II stream segment with very similar characteristics to Tributary A. Tributaries A & B converge immediately below the marsh noted as site 3 (see attached map).

Tributary C:

This unnamed tributary is ephemeral with no surface connectivity to Casino Creek.

Tributary D:

This unnamed tributary is ephemeral with no surface connectivity to Casino Creek.

Regulatory Framework:

This portion of the Judith River basin, including the Casino and Mill Creek drainage's, is classified B-1 in the Montana Water Quality Standards. Waters classified B-1 are suitable for drinking, culinary and food processing purposes after conventional treatment; bathing, swimming and recreation; growth and propagation of salmonoid fishes and associated aquatic wildlife, waterfowl and furbearers; and agricultural and industrial water supply. State water quality regulations prohibit any increase in sediment above naturally occurring concentrations in waters classified B-1 (ARM 16.20.618 2(f)).

Naturally occurring means conditions or materials present from runoff or percolation over which man has no control or from developed land where all reasonable land, soil and water conservation practices have been applied. Reasonable land, soil and water conservation practices include methods, measures or practices that protect present and reasonably anticipated beneficial uses. The state of Montana has adopted Forestry Best Management Practices (BMPs) through its Non-point Source Management Plan as the principal means of meeting Water Quality Standards.

Existing beneficial uses in the analysis area include domestic, stock and lawn & garden use water rights for groundwater sources. Surface water sources include stock, irrigation, and lawn & garden and domestic uses. Sensitive beneficial uses in the analysis sale area include aquatic life support and cold water fisheries and surface domestic use.

Casino Creek (MT41S004-4), the main watercourse draining the proposal area, is listed as a water quality limited water body (as per Section 303(d) of the Clean Water Act) in the 305(b) report. The 303(d) list is compiled by the Montana Department of Environmental Quality (DEQ) as required by Section 303(d) of the Federal Clean Water Act and the Environmental Protection Agency (EPA) Water Quality Planning and Management Regulations (40 CFR, Part 130). Under these laws, DEQ is required to identify water bodies that do not fully meet water quality standards, or where beneficial uses are threatened or impaired. These water bodies are then characterized as "water quality limited" and thus targeted for Total Maximum Daily Load (TMDL) development. The TMDL process is used to determine the total allowable amount of pollutants in a water body or watershed. Each contributing source is allocated a portion of the allowable limit. These allocations are designed to achieve water quality standards.

The Montana Water Quality Act (MCA 75-5-701-705) also directs the DEQ to assess the quality of state waters, insure that sufficient and credible data exists to support a 303(d) listing and to develop TMDLs for those waters identified as threatened or impaired. Under the Montana TMDL Law, new or expanded nonpoint source activities affecting a listed water body may commence and continue provided they are conducted in accordance with all reasonable land, soil and water conservation practices. Total Maximum Daily Loads have not been completed for the Casino Creek drainage. DNRC will comply with the Law and interim guidance developed by DEQ through implementation of all reasonable soil and water conservation practices, including Best Management Practices and Resource Management Standards as directed under the State Forest Management Plan.

The causes of impairment in Casino Creek are nutrients and suspended solids with the probable source being a domestic wastewater lagoon. According to this report, the ~12-mile reach of Casino Creek's cold water fishery is threatened. Casino Creek is currently listed as a low priority for TMDL development.

The Montana Streamside Management Zone Law (MCA 77-5-301) and Rules regulate timber harvest activities that occur adjacent to streams, lakes and other bodies of water. This law prohibits or restricts timber harvest and associated activities within a predetermined (SMZ) buffer on either side of the stream. The width of this buffer varies from 50-100 feet, depending on the steepness of the slope and the class of the stream.

The Montana Stream Protection Act (MCA 87-5-501) regulates activities conducted by government agencies that may affect the bed or banks of any stream in Montana. This law provides a mechanism to require implementation of BMPs in association with stream bank and channel modifications carried out by governmental entities. Agencies are required to notify the Montana Department of Fish, Wildlife and Parks (MDFWP) of any construction projects that may modify the natural existing conditions of any stream.

Soil Resources/Geology:

The proposed sale area is located on flat to moderate slopes, with some steeper slope occurring along draw features. Soils within the proposed sale area formed in alluvium, colluvium and residuum derived from sandstones and shales. The average annual precipitation is 20 inches.

Soil survey data from the NRCS Fergus County Soil Survey indicate that the majority of the forest soils in the project area are associations of Mocmont-Lipke (Map Unit 169) on areas of 15-45% slopes and complexes of Mocmont-Oraid (Map Unit 170) on areas of 2-25%.

The Mocmont-Lipke soils are sandy loams to sandy clay loams that are deep and well drained. The main timber management limitations of these soils are steepness of slope and very low to low available water capacity, permeability and low soil strength. Low available water capacity decreases chances of revegetation and slow permeability and steepness of slope increases the hazard of erosion.

Mocumont-Oraid soils are sandy loams to sandy clay loams that are deep to moderately deep and well drained to excessively drained. Timber management limitations are very low to low available water capacity.

No especially unusual or unique geologic features were identified in the proposed sale area. The terrain is moderate, with feasible tractor ground except along steeper draw features.

Water Quality:

Both Casino and Mill Creeks have been impacted by accelerated rates of sedimentation. Existing road systems and grazing have contributed to these impacts.

All stream channels and ephemeral draw features on State section 16, T14N-R18E were evaluated for existing conditions and potential effects from proposed harvest activities. No stream channel instability was noted within the sale area.

Approximately 2 miles of existing county and 1.3 miles of private road access the proposed sale area. The county road is a high standard gravel-surfaced road that currently meets BMP standards. Portions of the private road system do not meet current BMP standards. Segments of this road system lacks adequate road surface drainage and controlled season of use. Isolated segments of road surface erosion and delivery to draws is occurring.

The existing crossing on Mill Creek in Section 15, T14N-R18E is too short. Sediment delivery from the road surface and fill is occurring as a result of inadequate length.

Cumulative Watershed Effects:

Past management activities in both Mill and Casino Creeks include timber harvest, grazing, fire suppression and road construction. Timber harvest activities have been moderate over the past 15 years, constituting approximately 390 acres of selective harvest. Grazing activities have been rather extensive, with the bulk of the activities concentrating in the riparian areas.

An evaluation of all stream channels and ephemeral draw bottoms draining the proposed sale area was completed by DNRC. All four watercourses draining the state section appear to be in relatively stable condition. None showed evidence of channel alterations resulting from peak flow events. Just east of the state section line, in section 15, tributaries A and B converge to form a single-thread channel. An existing road crosses immediately above or right at this feature. Above the road, there is a marshy, seepy area where any characteristics of either channel are lost. There is not an improved crossing at this site. It is expected that during peak run-off, water flows over the road surface and contributes to Mill Creek.

A cumulative watershed effects (CWE) analysis for the proposed sale area was completed by DNRC to determine the existing conditions of the affected watershed and the potential for cumulative effects due to increased water and sediment yields. The Mill Creek and Casino Creek (above its confluence with Mill Creek) watersheds were chosen as the analysis boundaries. These analysis areas were selected because they were determined to be the most appropriate scale to detect potential effects. A larger analysis area may mask existing and potential effects due to dilution. A summary of recent research suggests detection of hydrologic cumulative effects should focus on third-to fourth-order basins (NCASI, 1999).

The CWE analysis was completed using a Level II coarse filter screening (outlined in SFLMP

Watershed RMS # 7). The coarse filter approach consisted of on-site evaluation, mapping the percent forested of the watershed and documenting history of past timber management activities through the use of maps, 1990 aerial photographs and harvest records. Field reconnaissance and assessments were used to collect additional data and to verify information obtained through aerial photo and map interpretation.

Existing cumulative watershed effects due to increases in water yield are unlikely in either watershed due to the following reasons:

- Only a moderate amount of the watershed areas has been harvested in the past 15 years.
- The existing partially forested natural condition of the watersheds. Open, range-like watersheds evolved under conditions with less forest crown and thus less evapotranspiration.
- Presently, there is likely more total forest cover and leaf area in the watersheds following range encroachment and fire suppression.

A detailed water yield analysis was not completed for the Casino Creek or Mill Creek watersheds due to the low potential for and lack of evidence of increased water yield due to timber harvest activities.

Existing harvest levels are below those normally associated with detrimental water yield increases. It is generally excepted that up to 20-30% of the watershed area can be harvested before detectable increases in peak flows (USFS, 1974). Table 1 below summarizes the existing conditions of the Casino Creek and Mill Creek watersheds.

TABLE 1.

MILL/CASINO PROPOSED TIMBER SALE
Watershed Existing Conditions Analysis

Watershed	Drainage Pattern	Total Acres	Existing Road Miles	Percent Forested	Percent Harvested
Mill Creek	Perennial	2002	9.3	64%	10.5%
Casino Creek	Perennial	4949*	13.8	39%	3.6%

* The analysis area includes only the watershed acreage from the confluence with Mill Creek to the headwaters of Casino Creek.

All primary and secondary roads within the proposed sale area were evaluated. Field evaluation and results from the coarse filter analysis indicate that past management activities within the analysis area have resulted in impacts to water quality. These impacts are limited to sediment delivery and erosion from roads and are restricted to stream and draw crossings and isolated segments of existing roads.

Cold Water Fisheries:

Fisheries surveys completed by the Montana Department of Fish Wildlife & Parks (DFWP), found Brook trout, Mottled sculpin and White suckers in Casino Creek along reaches in Section 21, T14N-R18E (Tews, A., DFWP, 1998).

No data exists for the adjacent Mill Creek, however it is likely to contain similar species as Casino Creek.

No known fish bearing streams exist on the state section. Two of the drainage features (C & D) are ephemeral in nature, and therefore cannot support fish. The other two drainage features (A & B) contain isolated segments of perennial flow, but flow subsurface before reaching Mill Creek.

Habitat conditions in Casino Creek were noted as suitable for trout, with hard cobble substrate and silt throughout the reach inventoried. The majority of the reach inventoried by MDFWP has

excellent bank cover which provides shade and streambank stability. There are isolated segments that show signs of excessive trampling and browsing from cattle use.

ENVIRONMENTAL CONSEQUENCES

The proposed timber sale is comprised of two alternatives, an action and no-action alternative. The action alternative would selectively treat up to120 acres. Approximately 1.3 miles of existing private road would be improved to meet BMPs along with approximately 0.75 miles of newly constructed roads.

Noxious Weeds:

Under the Action Alternative, DNRC would follow an integrated weed management approach to help prevent the introduction and establishment of noxious weeds. A combination of prevention, revegetation and monitoring should be implemented to reduce the possible infestation and spread of weeds associated with this project.

Soil Resources:

The no-action alternative would have minimal effects to soil resources. Existing roads require maintenance and additional surface drainage. With the no-action alternative, existing roads would continue to erode and deteriorate.

Skidding, slash disposal and site preparation can cause rutting, erosion, soil compaction, displacement and subsequent loss of site productivity. Risk for soil impacts are higher on tractor units on steeper slopes. Impacts to soil resources would be minimized through planning and mitigation designed by DNRC.

Cumulative effects to soils may occur from repeated ground skidding entries into the harvest area and additional road construction. Implementation of skidding and slash disposal mitigation measures would limit the area impacted and therefore present low risk of cumulative effects. Future stand entries should use existing trails and landings. Slash disposal operations should be planned to retain organic matter for nutrient cycling to maintain long-term soil productivity.

Water Quality:

Under the No Action Alternative, the existing substandard roads with inadequate surface drainage, failing stream crossings and unimproved drive-through ford crossings would continue to impact water quality and downstream beneficial uses unless mitigation and remedial actions are undertaken.

The total .75 miles of proposed new road construction for the action alternative is considered to have minimal risk to water quality and beneficial uses; provided site-specific design and mitigation measures are met. Otherwise, the risk of adverse impacts and inoperable conditions may occur. Proper application of BMPs and site-specific designs and mitigation measures would reduce erosion and potential water quality impacts to an acceptable level as defined by the water quality standards. Acceptable levels are defined under the Montana Water Quality Standards as those conditions occurring where all reasonable land, soil and water conservation practices have been applied.

A 10-foot extension will be added to the existing Mill Creek crossing in section 15, T14N-R18E (see map, site 4). This improvement, along proper application of BMPs and additional mitigation measures are expected to improve the long-tern stability of this site and reduce potential sediment input into Mill Creek.

Some short-term impacts to water quality may occur due to sediment induced at stream and ephemeral draw bottom crossings during or shortly after new road and crossing construction activities. Risk of impacts occurring during new stream and draw crossing installations would be minimized provided site specific design recommendations from DNRC Hydrologist and MDFWP Fisheries Biologist are met. All stream crossing sites must be approved by MDFWP through the permitting process required under the Montana Stream Protection Act.

Proper application of BMPs and site-specific designs and mitigation measures will reduce erosion and potential water quality impacts to an acceptable level as defined by the water quality standards. Acceptable levels are defined under the Montana Water Quality Standards as those conditions occurring where all reasonable land, soil and water conservation practices have been applied.

The proposed activities have a low potential to contribute to the degradation of downstream water quality and beneficial uses. The primary soil and water concerns associated with the proposed timber sale activities are sediment delivery to the local stream channels and draws. These limitations can be overcome by skid trial planning, minimizing disturbance, proper season of use, installing standard drainage features where needed and timely grass seeding of trails and road prisms. Vegetative regrowth is a critical factor in avoiding chronic sediment sources from harvest activities.

Portions of the sale area are drained by ephemeral draws, swales and wet areas that lack discernable stream channels. Equipment restrictions and designated crossings should be utilized to protect these areas.

Portions of the existing 1.3 miles of low standard private road and state road will be improved under the proposed action to a standard that meets BMPs. These improvements include, but are not limited to, appropriate road surface drainage features where needed, spot gravel surfacing and adequate sediment buffers along road segments adjacent to stream channels and draw bottoms.

These improvements are expected to decrease existing and future risk of sediment delivery to streams and draws and result in long term improvements to water quality. There is little risk of long-term adverse impacts to water quality and beneficial uses occurring as a result of the proposed action alternatives.

DNRC will utilize all reasonable mitigation and erosion control practices during the design, reconstruction and construction of all roads, stream and draw crossings.

Cumulative Watershed Effects:

The no-action alternative would have minimal effects to cumulative watershed effects. Moderate timber management activities in the Casino Creek drainage and the range-like landscape have resulted in undetectable cumulative watershed effects from forest management. Cumulative impacts from cattle grazing may continue to occur, unless the current management strategies are changed.

There are no cumulative watershed effects constraints associated with the proposed sale area. This is due to the following reasons:

- Low precipitation region.
- No surface connectivity between stream features draining the proposed sale area and downstream perennial stream channels.
- Proposed harvest units are located at an adequate buffer distance from the perennial stream channels.
- No SMZ harvest.

- The proposed improvements to the existing road system will benefit long term soil and water quality.
- The proposal if for selective harvest in stands that are overstocked from that of pre-fire suppression and range encroachment stands.

Cold Water Fisheries:

The no action alternative would continue to impact cold water fisheries habitat through increased bank instability, erosion and sedimentation due to the existing road conditions and the current grazing plan.

The proposed activities have the potential to increase sediment input into the affected stream channels during the short-term. However, recommended mitigation measures aimed at stabilizing existing roads and crossing structures, and riparian tree retention will minimize long-term impacts to water quality and fish habitat.

It is unlikely that the proposed actions will impact shade, temperature or large woody debris recruitment of fisheries streams. This is due to the fact that no harvest activities are proposed adjacent to any known fish bearing streams. No SMZ harvest is proposed for this sale.

Best management practices, Fisheries and Watershed Resource Management Standards (RMS) outlined in the State Forest Land Management Plan (SFLMP) and site specific design recommendations of DNRC hydrologist would help minimize the potential impacts of the proposed action on the cold water fisheries in the affected streams.

RECOMMENDED MITIGATION MEASURES

Operations conducted in or near draw features and on steeper slopes have a higher risk of impacting soil resources and water quality. The following recommended mitigation measures would help minimize risk of impacts during the proposed activities. These mitigation measures are standard practices that may be applied to all harvest activities associated with the proposed Mill-Casino Timber Sale.

General Road Design and Mitigation Measures:

- Ensure that existing road systems comply with minimum BMP standards. Mitigate existing road drainage where necessary and ensure that **mitigation is concurrent with harvest operations (especially road surface drainage)**. Ensure that all hauling operations are suspended during wet periods **before rutting occurs**.

- Construct drain dips, grade rolls and other drainage features where necessary and practical to insure adequate road surface drainage. **Install and maintain all road surface drainage concurrent with new road construction, reconstruction and reconditioning.** Drain dips constructed on sustained road grades greater than 8% may require more frequent spacing and/or gravel surfacing to function properly. Sustained road grades greater than 10% may require installation of conveyor belt water diverters.

- Stabilize newly constructed road cuts and fills following excavation. Stabilization can be met through one or more of the following: seeding or mulching. Apply seed as soon as conditions permit to maximize successful establishment of grass cover. Local professional judgement and consideration for temperature and precipitation would determine when seeding is likely to be most successful. Delay of seeding may require scarification of crusted soils.

- Drainage features located in areas adjacent to stream channels with inadequate buffer capacity should be provided with effective sediment filtration through the use of slash filter windrows, filter fabric fencing or straw bales. Slash filter windrows shall be used where fill depth is greater than 2 feet. Note: straw bales alone may not be effective in areas with heavy concentrations of livestock or big game.

- Temporary or abandoned roads should be left in a condition that will provide adequate drainage and will not require future maintenance. Roads that are abandoned should be partially obliterated through ripping and seeding. Where it is available, slash should be scattered across the ripped road surface. Water bars should be installed at regular intervals to facilitate surface drainage.

- Construct additional drainage features on all approaches to draw crossings to avoid concentrating runoff at crossing sites. Drainage features should be located close enough to the crossing to minimize the runoff contributing area, but at an adequate distance away from the crossing to provide for effective sediment filtering.

- Ditches with direct delivery to streams or ephemeral draws should be filtered at the out let by using slash or filter fabric and straw bales.

- Rock armor both the inlet and outlet of **all CMP installations**. Provide energy dissipaters at the outfall of **all CMP installations**. Rock used for armoring should average 12 inches in diameter and not less than 6 inches in diameter.

- When excavating material in and around stream and draw crossings (i.e. installing new CMPs, cleaning inlets and outlets, constructing ditches, etc.) Special care should be taken so as not to cause an excessive amount of disturbance to the stream channel or area immediately adjacent to the crossing site. Excess or waste material should be disposed of at a location where it will not erode directly into the stream or draw bottom.

- Site 4 (see map), will require a 10-foot extension onto the existing CMP. Ensure that extension is installed on streambed grade. Sediment fence and any additional requirements required in the 124 permit will be met to ensure the fullest protection of the resources. Immediately following the installation of the extension, stabilize fill with grass seed. If fill is greater than 3 feet, install slash filter windrows in addition to seeding.

- Sites 1 & 3 (See project area map) are seasonally wet and subject to rutting during use. These two locations would require turn-piked (raised) road construction and gravel surfacing, otherwise the risks of adverse impacts and inoperable conditions may occur. If needed, more detailed specifications may be supplied during contract writing.

- Site 2 may require spot gravel surfacing. This would depend on season of use, availability of gravel and forest officer discretion.

General Design and Mitigation for Harvest Units:

- Limit equipment operations to periods when soils are relatively dry (less than 20%) to minimize soil compaction and rutting, and maintain drainage features. Check soil moisture conditions prior to equipment start-up. Some moister conditions are accepted on harvest units where tractors remain on designated trails and timber will be winched to trails. Soils will likely not dry out until late June or July. All road construction and drainage improvements should be completed by the fall prior to winter operations.

- Equipment restriction zones (ERZ), should be marked and maintained along all ephemeral draws and wet areas (including the head end of tributaries A & B). Operation of tracked or wheeled equipment should be limited to designated crossings. Minimize number of crossings and space at 200 feet, where feasible. This will minimize soil disturbance within the vicinity of the draws. Steep approach grades (>8%) will incorporate surface drainage features.

- Restrict ground skidding to slopes < 45. On short steep slopes > 45%, consider winch line skidding.

- Skid trails with considerable disturbance over 30% should be grass seeded.

- Whole tree skidding can remove some nutrients from growing sites and reduce slash hazard. Where feasible, leave available slash to provide for nutrient cycling and maintaining long term soil productivity at about 10 tons/acre. On whole tree skidding areas, consider return skidding the slash.

- Limit scarification to 30-40% of harvest units. Tractor piling on wet soils or slopes over 35% should be avoided. Consider lop and scatter or jackpot burning on steeper slopes.

- No slash piling/burning should occur in draws or other areas of concentrated ephemeral flow.

- **Use minimum SMZ width required under SFLMP Watershed RMS # 10.** These widths may be greater than those required under the SMZ Law and Rules. The SMZ widths prescribed in Watershed RMS # 10 are dependent on: the erosion potential of soils at the site, the steepness of the side slope and the presence of any topographic breaks.

Noxious Weeds:

- All road construction and harvest equipment should be cleaned of plant parts, mud and weed seed to prevent the introduction of noxious weeds. Equipment will be subject to inspection by forest officer prior to moving on site.

- All newly disturbed soils on road cuts and fills should be promptly re-seeded to site adapted grasses to reduce weed encroachment and stabilize roads from erosion.

- DNRC should monitor the project area for two years after completion of harvest activities to identify occurrence of any noxious weeds on site. If noxious weeds occur, a weed treatment plan should be developed and implemented to eradicate the noxious weeds.

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MILL-CASINO PROPOSED TIMBER SALE

Section 16 SE ¼, T14N-R18E

Project Area Map

Mill Creek Proposed Timber Sale
Section 16 SE ¼, T14N-R18E
Watershed Analysis Map